v. 11 #1

The MONTHLY REVIEW

Published Monthly by the
American Electroplaters Society

A SOCIETY FOR THE ADVANCEMENT
OF THE
SCIENCE OF ELECTROPLATING

JANUARY, 1924

Entered as second-class matter, September 26, 1922, at the Post Office at Oneida, N. Y., under the Act of August 24, 1912.

Acceptance for mailing at special rate of postage, provided for in section 1103, Act of October 3, 1917, authorized September 26, 1922.

Copyright, by American Electroplaters Society.

FREE GE HOOK
WAYNE
UNIVERSITY
SCIENTIFIC LIBRARY

EXECUTIVE BOARD, A. E. S., 1923-1924

President
John E. Sterling, 468 Grand Ave., Long Island City, N. Y.

First Vice-President
E. J. Musick, 915 Chestnut St., St. Louis, Mo

Second Vice-President
W. E. Woodmansee, 1427 Lee Place, Detroit, Mich.

Secretary-Treasurer
Frank J. Hanlon, 216 N. Jefferson St., Chicago, Ill.

Past President
Walter J. Allen, 451 Norwood Ave., S. E., Grand Rapids, Mich.

Editor
F. C. Mesle, 166 Willow Place, Sherrill, N. Y.

Associate Editor
Dr. W. Blum, Bureau of Standards, Washington, D. C
Joseph Hass, Jr., 211 South High St., Muncie, Ind.

Don't Forget Founders' Day

and help us celebrate that event by attending the

ANNUAL BANQUET

of the New York Branch of the A. E. S.,
to be held at the Aldine Club
200 Fifth Ave., Cor. 23d St., New York City

ON SATURDAY, FEBRUARY 23d, 1924

Open Session 3:30 p. m.
Banquet 7 p. m. Dancing 9:30

MR. CHAS. H. PROCTOR will conduct the afternoon session, which is open to all visitors

We will have prominent speakers and first-class papers at this session. High Class Entertainment during dinner and dance. Visiting ladies are cordially invited. A committee will entertain them during the afternoon session.

TICKETS $4.00 PER PLATE

WM. FISCHER, Chairman
D. E. STIERS, Publication Committee

MONTHLY REVIEW

Published by the

American Electroplaters' Society

ONEIDA, NEW YORK

Editor's Office, 166 Willow Place, Sherrill, New York

VOL. XI JANUARY, 1924 No. 1

EDITORIAL

REPORT OF THE RESEARCH COMMITTEE

New York, December 8, 1923.

To the Officers and Members of Subordinate Branches,
A. E. S.:

Gentlemen:

In submitting the following report to our editor for publication, I do so with the sincere hope that each and every one of our members will read it over carefully and give the suggestions contained therein deep thought. I firmly believe that if our members will get into closer and more personal contact with the work of the Research Committee, and the work of the Bureau of Standards, that we will be able to gain a great deal more of the personal benefit of their work at the Bureau.

And the combined efforts of the Bureau of Standards, and A. E. S. Research Committee, and the Branch representatives, as outlined in the above report, will not only give the society more prestige, but it will make our work of a great deal more value to the plater, as well as of untold benefits to the manufacturer of PLATED PRODUCTS in general; because we realize that whatever knowledge we may gain by this research work is of no practical value to us if we do not put same into practice, and if we do make practical use of this knowledge the beneficiary is the MANUFACTURER OF PLATED PRODUCTS, therefore, he should be willing to assist us a little in doing research work for his benefit.

I would further suggest that the various Branches of

our society take up and discuss such questions or problems as they wish with the Research Committee, to bring before the Bureau of Standards, at these joint meetings, and in that way help the Research Committee and the Bureau to be of a GREATER assistance to our MEMBERSHIP, and the results of their work will be of a more and greater direct value to us all.

Trusting our membership will do their utmost to support and encourage the work of the Research Committee in every way they can, I am

Sincerely yours,
J. E. STERLING,
Supreme Pres. A. E. S.

Report of the Research Advisory Committee of the American Electroplaters' Society in attendance at the Research Advisory Committee meeting, November 16 to 17, 1923, at the Bureau of Standards, Washington, D. C.:

The members of the Research Advisory Committee of the American Electroplaters' Society, Messrs. Charles H. Proctor, S. E. Hedden and O. J. Sizelove, attended the Research Advisory Committee meetings on electroplating at the Bureau of Standards, Washington, D. C., on November 16 and 17, and are pleased to report to the Supreme President of the American Electroplaters' Society, Mr. J. E. Sterling, and the Executive Board as follows:

The program as outlined by the Bureau of Standards was as follows:

Friday, November 16

10 A. M.—General discussion of the program and scope of research and publicity.

11 A. M.—Review principles of acidity and throwing power.

12 to 2 P. M.—Lunch and inspection of laboratories.

2 to 3 P. M.—Throwing power in nickel solutions (H. E. Haring).

3 to 4 P. M.—Nickel anode investigation (C. T. Thomas).

Saturday, November 17

10 to 12 A. M.—Protective value of nickel plating. Discussion by the Advisory Committee and visiting members of the Non-Ferrous Advisory Committee.

12 to 2 P. M.—Lunch and inspection of the research work now being carried on by Mr. H. E. Haring, Mr. Winkler and Mr. C. T. Thomas of the Bureau of Standards Research Staff.

2 to 2:30 P. M.—Nickel plating on zinc (R. Thompson).

3 to 4 P. M.—Miscellaneous topics and closing of the Research Advisory Committee sessions.

Dr. W. Blum in a brief and interesting talk outlined the scope of the present session and the value to the electroplating and electrotyping industries that would result from the co-operation in the research work of the Bureau and the American Electroplaters' Society.

Dr. Hillebrand, Chief of the Chemical Division, in brief and well chosen remarks made the address of welcome to those in attendance at the opening session.

Mr. Charles H. Proctor responded to Dr. Blum and Dr. Hillebrand on behalf of the Advisory committee and the American Electro Plater's Society and stated that in his opinion that the work now being accomplished by the Bureau of Standards was of untold value to the members of the American Electro Plater's Society and the entire plating industry.

Members of the Bureau in attendance were as follows:

Dr. Hillebrand, Chief of Chemical Division; Dr. W. Blum, Chief Chemist; Mr. T. P. Sager, Associate Chemist; Dr. Smithers, Chemist; Mr. H. S. Rawden, Chief of the Metal Division; Mr. Winkler, Chemist, Mr. Thomas and Mr. Haring, Chemists; and Mr. Randolph, Publicity Man of the Bureau.

The visitors included:

Dr. King, metallurgist, American Rolling Mills, Middletown, O.; Dr. Hocker and Mr. Farnsworth of the Chemical Laboratories of the Western Electric Co., Engineering Department, New York; Dr. Mercia, International Nickel Co., New York; Mr. Price, chemist and metallurgist, Scovill Mfg. Co., Waterbury, Conn.; Mr. Geo. B. Hogaboom, electroplating advisor to the Bureau of Standards, P. F. Corbin Co., Division of the American Hardware Corp., New Britain, Conn.; Mr. Sorrow, production manager, P. F. Corbin Co.; Mr. Williams, chief metallurgist, General Motors Corporation, Dayton.

The Advisory Committee of the American Electroplaters' Society included:

Mr. O. J. Sizelove, August Goertz Company, Newark, N. J.; Mr. S. E. Hedden, Enameled Metals Co., Etna, Pa., and Mr. Charles H. Proctor, Roessler & Hasslacher Chemical Co., New York.

Several members of the Non-Ferrous Advisory Committee, which also held a special session, were in attendance at this meeting.

Every minute of the two days' sessions was taken up and possibly another day could have been used to advantage by the Advisory Committee.

The nickel anode investigation of Mr. C. T. Thomas, in the opinion of your committee, is a very important one and when the work is completed the plater will know what type and composition anode will give the maximum of results in solubility and corrosion.

The throwing power in nickel solutions is another very important work being carried on by Mr. H. E. Haring. Throwing power is a very important subject and when Mr. Haring's work is completed there is no doubt that this subject will be more thoroughly understood by the entire plating industry.

Nickel plating on zinc is a subject that the plating industry is very much interested in at present and we shall watch with great interest the work of Mr. M. R. Thompson. Zinc, on account of its low cost and ease of deposition, is the cheapest factor to use in the protection of steel or iron from atmospheric corrosion. What is now mostly desired by the commercial plating industry is a fool-proof nickel solution, one that will deposit nickel upon zinc plated steel, die castings, sheet zinc, etc., with the maximum of efficiency and without any more difficulty than is experienced in the nickel plating of steel, iron, brass or copper in a normal nickel solution. We have good reason to believe that when Mr. Thompson's work is completed we shall know much more about the possibilities of successful nickel deposits upon die castings, sheet zinc and zinc plated steel than heretofore.

Dr. Blum will continue to carry on his good work in connection with the American Electroplaters' Society. It is

his aim, after January 1, 1924, to visit each branch of the Society and address the members upon the work done by the Bureau staff during the past year by practical demonstrations of the apparatus developed by the Bureau and other topics of interest to the Society.

The Advisory Committee believes that the entire membership will profit by the co-operation of the Committee and the Bureau, but it is the opinion of the Committee that while the personnel of the Advisory Committee be still maintained as a part of the work of the Supreme Society, the scope of the work in connection with the Bureau be enlarged so that each branch shall send a representative to the Advisory Research Committee meetings at the Bureau at least once a year. The representative to be nominated by the presiding officer of the branch and the very best man that it is possible to selecte be sent to Washington as the branch's personal representative. Your Advisory Committee believes that the society will gain more prestige and much will be accomplished of benefit to the society and the commercial plating industry by such a representative gathering from the entire society.

Your committee realizes that the financial cost of sending such a representative from each branch, even only once a year will be more than some branches can possibly afford. We believe, therefore, that the time is ripe to solicit financial aid from the manufacturers who maintain plating departments and desire such departments to progress. In many influential societies contributions are made by manufacturers to support such work as research work, etc., each year with a stated sum of money.

Your committee believes that the Supreme Society, through its executive board, should devise ways and means so that the important work being carried on by the Bureau of Standards and the American Electroplaters' Society can be brought to the attention of the American manufacturer and enlist his support in the work which, after all, will be for his benefit commercially and the betterment of his product. The work now being carried on by the Bureau on nickel anode investigation alone will be worth thousands of dollars to the manufacturer who does nickel plating and

must purchase nickel anodes for the finishing of his product.

Surely for such value a small compensation from each will create a fund of sufficient size so that the work outlined can be carried on with ever increasing value to the commercial plating industry.

Your committee, therefore, desires that the suggestions outlined be given due and mature consideration so that financial aid from manufacturers will ensure a permanent fund that will enable the work to be continued and a true representative gathering of the American Electroplaters' Society to visit the Bureau of Standards, Washington, D. C., at least once a year.

CHARLES H. PROCTOR,
S. E. HEDDEN,
O. J. SIZELOVE.

DESIGNING HOLDERS FOR USE IN ELECTROPLATING

By W. S. Barrows

The subject of Holder designing is one which the writer is convinced receives for less thought and tsudy than is necessary to obtain efficient results from their use under the varied conditions existing in many plating plants. There are many details to be considered when designing holders, a few of the questions which the writer considers vital with reference to this point are—

What is the nature of the solution in which the holder is to be employed?

Is the current available at the plating tank sufficient to warrant the type of holder in question?

Will the holder permit a maximum number of pieces to be placed in the plating tank in a manner which will ensure a uniform deposit on the different pieces, or at least facillitate the deposit of metal to form more heavily on portions which require extra heavy plate when subjected to actual use by the customer?

What portions, if any, may be made of steel or iron, in order to either strengthen the holder or effect economy in construction costs?

It the holder as simple as I can make it and comply with requirements?

Is the article to be plated on the holder, one requiring best possible plate or is it a cheap job?

Is it easily loaded and quickly unloaded?

These and other points should be considered carefully before adopting a holder.

Holders employed in plants where the personnel of the department and changes frequently require to be constructed in as durable manner as possible to prevent damage due to lack of respect which the novice displays for this type of plating accessory.

Brass or copper conducting spines should be used in all holders when other conditions will permit. The well known fact that brass or copper is better conductor of electricty than iron or steel is the prime reason. In case steel or iron holders are adopted, the suspending hooks should be made of brass or copper, to avoid the frequent failures due to faulty contact with the negative rod on plating tank. Corrosion of the contact point or points is ultimately sure to occur. The steel or iron contact hook may be extra heavily plated with copper, brass or nickel to temporarily facilitate good contact, but usually the usefulness of the holder, if kept in good repair will exceed the wearing qualities of the metal deposited on the contact points and a second or third deposit is required. If common labor is employed in the department removing wor kfrom the tanks when plated, and the employees who remove the work from the holder are careless, it is very easy for improperly plated work to find tis way into the buffing department or the finished stock bin as the case may be.

Whenusing iron wire for plating holders there are a few points to remember if you desire best results. Use a soft wire if possible. If ordered specially for the purpose, specify E. B. B. soft iron wire. E. B. B. denotes Extra Best Best grade which has the higest conductivity and is quite uniform in quality, tough and pliable. B. B. indicates Best Best grade, which is less uniform and tough and is lower in conductivity. The Grade known as Best is lowest in conductivity and more brittle and is poorest grade.

Short hooks on holders made of brass wire may be made of hard wire to withstand rough use and sustain weight of heavy pieces. Also frail brass frames may be reinforced

with hard iron wire to make frame more rigid and less liable to become bent or twisted, but, maintain a good path for flow of current to every piece by using lowest resistance metal possible.

There are certain laws of resistance which it is well to bear in mind when designing holders. Three of these laws are

(I)—"The resistance of a conductor is directly proportioned to its length."

(II)—"The resistance of a conductor depends upon the temperature and is affected by any cause which modifies its molecular condition." "All metals have their resistance increased by an increase in temperature."

This means that the size of the main spine and the material of which it is made are vitally important matters particularly so in brass or copper plating, electro-zincing, etc., where high current densities are often permissable.

Frequently holders are made which meet requirements in the nickel bath, but which will not conduct the available current in the electro-cleaner without heating. Such a holder is certainly incorrect. An enlarged spine would remedy the defect and the improvement in results well repay the plater for the extra work or material.

The resistance of a mil-foot of copper is 10.79.

The resistance of a mil-foot of brass is 19.41 (approsc.)

(66%-34%)

The resistance of a mil-foot of Iron is 63.35.

By these figures you see that iron has almost 6 times the resistance of copper and the question of conductivity should require no further mention in this paper.

Pieces which require a uniform deposit over the entire surface should be placed on holders in a manner which will permita uniformly easy migration of the metal ions to all portions. If this is practically impossible, then the objects should be rearranged, moved or turned as the case may require to effect a resultant deposit of greater uniformity than would otherwise take place. Present day commercial plating is too frequently declared high grade when absolutely no attention is given t' e conditions under which the deposit is obtained, other than those directly responsible for a de-

posit which adheres and will color under buffing treatment without cutting through.

The writer does not wish to be quoted as saying that the methods, conditions or results, which prevail at the C. C. M. Co's. plating plant are ideal. We are aware they are not, but as we process 99% o fthe bulk of our product by the still tank method, it is needless to say we employ a large assortment of holders. In fact, our preparatory section is one of the most interesting to visitors. We have constantly at command, over 3500 holders, some of which are comparatively large, holding over 400 pieces. The greater number are quite simple and easily constructed. I could relate many very convincing instances of increased production and decreased labor costs effected by improved holders.

In designing holders, consideration must be given the policy of your firm respecting quality of plating you produce, also their attitude relative to cost of production of good plating versus inferior plating. In the C. C. M. plant we employ a mechanic for the purpose of constructing and repairing holders tec., he is now sufficiently conversant with the various details to be quite valuable as a designer. In use, a holder should be placed in the plating bath so that portions of work which receive most wear or exposure or have indentations therein, will be toward the outer row of anodes in a double row tank, this is commendable practice because of the fact that the outer rows of anodes plate in our direction only while the center row plates in two directions and tests have proven that the side of a cathode facing outer row of anodes does receive a greater amount of metal than the side facing center row of anodes. If the center row of anodes has an effective surface area porportionately larger than the effective surface area of the outer rows, the difference in deposit is reduced to nil, but it is our custom to use a full compliment of anodes on all three rods and also to guard against unequal deposits by changing position of cathodes during period of deposition when we deem the operation necessary.

All joints of holders should be made firm by soldering, by this we do not mean a blotch of solder the size of ten cent piece, make the holder neatly. If it is to be an efficient aid in plating use care in construction, make it so that it

will not look like a piece of junk before you use it, it will assume that appearance quickly enough after being placed in service.

One point which is often overlooked by platers when designing holders or when ordering anodes for nickel plating is this—If you find that it is possible to employ a certain current density upon a given surface area when placed on most suitable holder, you can devise and obtain satisfactory results with the exception of burned portion at lower extremity of holders, and you are forced to employ less current and possibly increase the duration of plating, there may be one of two things responsible which is often easily corrected. The holder is either too short or the anode too long. If a twenty inch anode is used, a twenty inch holder should be employed, naturally due attention must be given the anodes as they wear away and length is lessened. If a solution depth of thirty inches is maintained in a nickel tank and twenty inch anodes are used in the solution, it is possible to obtain practically uniform deposits on cathodes suspended at depth of twenty-two to twenty-four inches. This holds good where the difference in solution depth and anode length is approxinately as we have state.

The writer has long since ceased using anodes of a length exceeding the length of bulk of cathodes processed.

It should be unnecessary to even mention the form of hook advisable as contact or suspension hooks, there being no reasonable argument against the use of a V shape hook, and its many advantages are obvious.

On page 422 of No. 10, Vol. 9, of the Metal Industry, there will be found an article written by Mr. Franklin W. Hobbs of Bangor Maine, in which he describes the construction of a holder which presents a minimum of surface to the action of the bath. One glaring fault with this type of holder is, that it must be loaded after the work has been cleaned or coppered and immediately prior to immersion in the nickel bath. We have experimented extensively iwth various materials on this type of holder and have yet to obtain satisfactory results from their use. There are no doubt many plantswhere holders of this type may be used and for such may prove very valuable.

The models which I will explain to you are only a few

of the smaller type holders which we use in the C. C. M. plant. In their present dimensions they may not appeal to you as having any value to you in your particular class of work. It may be possible however, to modify or alter a holder to meet your needs without departure from the principle or fundimental idea which prompted its construction.

Provide suitable safe quarters in which to keep your holders irregardless of their simplicity. The greater number of holders are quite conveniently kept hanging up, others may require shelves or bins, in any event, keep them in their proper place when not in use. Portions of cathodes requiring protection from deposits may be easily kept clean in a variety of ways—some of which I will demonstrate, using simple shields, shaders, tec.

W. S. BARROWS

ZINC CYANIDE SOLUTIONS AND A COMPLICATED ARTICLE

By Willard M. Scott

The fact that zinc plating constitutes the greater volume of work at the Frankford Arsenal has afforded the opportunity, in fact, has made it necessary, to make a prolonged and thorough study of this most complicated phase of electroplating.

Specifications requiring a uniform plating of .001 of an inch over all surfaces of a complicated article will naturally arouse the interest of any plater, particularly in view of the fact that the work was done on a productive basis and was given 100 per cent. inspection. The articles are gauge inspected before plating, and fifty different gauges are used in the inspection after plating to determine the thickness of the plating. This rigid inspection is necessary because of the close fits specified for assembled parts.

One of the most important features is the inside of the fuze body. There is a $\frac{1}{8}$x$\frac{3}{4}$ hole in the bottom, and chambers of different diameters. The plate must be of the same thickness in the hole, in the chambers, on the shoulders, etc. A zinc anode will not make an even deposit, in fact,

will have a tendency to make a rough and heavier coating than the outside. The proper result was obtained by using a steel anode made to fit the inside of the body, giving the anode a coating of zinc.

The electrical equipment consists of an eight volt, five thousand ampere generator, the current is controlled by a two field rheostat, and a resistance board on the return. There is a switch and ampermeter at every tank. Three volts are maintained at all zinc plating tanks.

The fuze bodies are boiled in the soda tank, rinsed, dipped in hydrochloric acid, rinsed, and then hung in a carbonate of soda solution for storage. This solution will also kill the acid in the pores of the steel.

Twenty fuze bodies are placed in a plating tank. The surface of one body is fifty-one and one-half square inches, twenty bodies making a total of one thousand and thirty square inches for the cathode. I will not exceed this in anode surface very much, for during our experiments I found one thousand and eighty square inches of anode surface was in the right proportion thus standardizing the cathode and anode conditions.

Not having a rheostat at each tank, the amperage is controlled, when a new solution is used, by varying the anode surface. This was found necessary in plating the outside thread of the fuze body. From one to eight hours is required before the amperage will allow the standard anode surface, and then our solution is in line with all other tanks, and my aim is to maintain same as such, which will govern the structure and properties of the deposit.

After leaving the work hanging in the plating tank for thirty minutes, reverse same and insert the inside zinc plated steel anode. This anode should remain about ten minutes before being taken out and work will remain to complete the hour with a deposit of .001 of an inch throughout.

The work when removed is rinsed in cold, then hot water, then subjected to a blast of compressed air to prevent any discoloring. This is essential, because of the rigid visual inspection.

The solution contains the following ingredients:

Zinc cyanide ..... 10 oz. per gallon
Sodium cyanide..... 8 " " "
Sodium hydroxide ..... 10¾ " " "
19 ampere per square foot.
3 volts for force.

The anodes are cast zinc, one and one-half inches square, by eighteen inches long. The distance between cathode and anode bars is nine inches.

The replenishing of the solution is a most important factor, as the throwing power depends upon it. When first starting these studies my idea was to replensh the solutions every night, and it took some time before I could realize my trouble was due to this erroneous practice. I find no two solutions working the same, most solutions are maintained with zinc by the anodes and some will exceed their original quota in metal.

Excess of cyanide or caustic will work apparently the same, such as to cause brittle and blistery deposits.

Free cyanide is essential to clean anodes.

Excess cyanide will insulate them.

Excess caustic will also cause a film as zinc hydrate.

To become better familiar with the constituents I will describe my method of replenishing eleven tanks of 150-gallon capacity. I have test plates of sheet steel with the same surface area as a tank of work, and with these hung in solution the amperage is brought to the proper amperage by the addition of sodium cyanide, then keep adding sodium hydroxide until the bottom of all holes are plating properly. If work should blister after this addition, zinc cyanide can be added. By following this system no coloring ingredients are needed, as a tweed to a white deposit can be obtained as desired.

Gauge inspection, particularly with micrometers, is quite a contention, but it makes the plater more particular and therefore more familiar with the ingredients of his solutions.

I would advise all platers using zinc cyanide solutions to adopt a system such as I mention, as using test plates at a specific voltage force to obtain the amperage, and a somewhat similar article to regulate his throwing power. If the system I speak of is followed you will notice the fast cor-

rosion of your anodes showing the self-replenishing power of your solution, and very seldom will you need zinc cyanide, thus reducing the cost of operation.

A heated tank will give wonderful results when cyanide and caustic is low, but zinc cyanide is continually added, and your color is beautiful, and your deposit is apparently good but light, but on a complicated article the near point is heavy, whereas the far point is very light.

Where very little zinc plating is done this sort of solution is satisfactory, inasmuch as the heating of the tank will give apparently the same deposit after weeks of idleness, but we are getting away from the perfect solution.

Specifications calling for a test in a salt spray of 20% for 48 hours might be considered severe, but with this solution I am speaking of no rust has ever shown itself; as a matter of fact, on two different endurance tests, one of these bodies stood thirty days of constant spray with no sign of corrosion. The second stood twenty-five days before rust appeared. These bodies were taken from ordinary work, and I am sure all bodies will stand a similar test from this solution.

The advantages of a perfect solution; that is, a solution that you know is working perfectly by this test, are many, such as zinc cyanide plating of steel before black nickeling. Black nickel will prevent rust but a short time; in fact, I consider it for coloring only. If you have spring steel, brass, or a combination of metals in one article to be black nickeled, the result, nine times out of ten, will not be uniform, but by zinc cyanide plating first, not only will corrosion be prevented, but the entire article will be uniform in color and of the darkest black that can be obtained.

At our recent convention at Providence we were criticised for the poor plating on automobiles. The first rain sometimes causing rust on the nickel plating. Now, think of the advantage this zinc cyanide plating would have if applied before nickeling, when the zinc plate alone stood 720 hours in a 20 per cent. salt spray without a sign of rust, but this may not be profitable to plate a heavy deposit before nickeling, so I will give my statistics for comparison of different kinds of plating that can be applied to the com-

mercial product. I will give my own experiments from the same piece of steel.

1. A nickel plate of ten minutes on steel stood the salt spray for 73 hours.

2. Ten minutes of zinc plate, and then ten minutes of nickel stood 360 hours.

3. Ten minutes of black nickel in the salt spray stood 119 hours.

4. Ten minutes of zinc plate, and then 10 minutes of black nickel 240 hours.

5. Ten minutes of zinc plate alone stood 133 hours.

BRANCH NEWS

Rochester Branch

The regular meeting of Rochester Branch was held at Powers Hotel Friday evening, December 14, President S. P. Gartland presiding.

The meeting was well attended and it is the earnest desire of the officers to make the meetings more interesting.

George G. Knecht, representing the Hanson Van Winkle Co., paid us a visit. He was called upon by the President for a few brief remarks. He responded by giving us an interesting talk on the plating business in general. The next member called upon was our old friend, Mr. R. Popez, who has recently returned from an extended trip to Cuba.

One of the progressive members brought up the question in regards to a superintendent of one of our leading manufacturing plants, who has sent out two small samples of strip metal brass and steel. One of each was sent to twelve other plating plants in our city to have a deposit of nickel. The object which is to find out the durability of the nickel luster. The result of this competition would eventually lead up to the adoption of a suitable formula. A general discussion of the question was indulged in by the members. The secretary was instructed to have the superintendent become acquainted with the educational features of the A. E. S., and also forward an application to the foreman plater of this plant to join our society.

At our next regular meeting arrangements will be made to hold a smoker and an invitation will be sent out to each forman plater in this city to come and partake of our A. E. S. hospitality.

Rochester Branch is looking forward to a prosperous year, and we are going after a larger membership.

Boston Branch

Boston Branch met Friday, the 21st, at the American House, at 8 p. m., with the President in the chair.

After the regular order of business was over a motion was made that this branch hold a stag party some time in February for the members of the branch only. A committee was appointed to take care of the party.

The committee on research made a report of the 56 cases that it had taken care of in the New England States. All have been cured and it has also answered one hundred letters from all over the U. S. A., and has received letters from Canada, France, Spain and Australia. Stating that it shows how hard this committee is working only this day we received a telegram from Arkansas asking for assistance. Any one knowing of any plating shop where there is a plater who is affected in any way with the itch, why this committee will be only too glad to help him the best that they know how. I meant to state that all those one hundred letters have been answered.

The report was approved as one of progress.

Detroit Branch

Out-of-town A. E. S. members' meeting was poorly attended Saturday night, doubtless due to the zero weather. President B. E. Miller presided. Minutes of previous meeting read and approved.

Communications were received from Supreme President J. E. Sterling enclosing a report from research committee advisory board, Metal Industry, Andrew V. Re.

Two applications for membership in Detroit Branch were received.

Banquet committee reported progress and submitted a place and tentative menus; will, no doubt, hold it early in March.

Upon motion of R. L. Shepard a research committee was appointed as follows: E. G. Lovering, chairman; R. L. Shepard, T. C. Eichstaedt, L. P. Brockway and Elmer W. Woodmansee.

Under good of order, Mr. Stenhagen, chemical engineer of Shepard Company, submitted a very concise explanation of the problem concerning amperage flowing through tanks in series. This will be forwarded to REVIEW for publication.

Detroit is extremely fortunate in securing highly technical experts through the efforts of Mr. R. L. Shepard.

Meeting adjourned at 10:45 p. m. until February 1, 1924, Friday.

Chicago Branch

Chicago Branch held its regular meeting on January 12, with Vice-President James Emmett in the chair. The attendance was very good and all the members are showing a lot of enthusiasm towards our banquet.

We received two applications and elected three to active membership. We also received one resignation.

The banquet committee reported that everything was ready for our banquet and from the interest shown everywhere we expect this to be the most successful banquet Chicago Branch ever held.

Following our business session the librarian had all of us plating everything that was metalic with the questions he had in the question box.

Question No. 1—What is the best lining for a tank containing hot nitric acid?

Answer No. 1—A stoneware glazed tank was recommended.

Question No. 2—What is the best lubricant for ball burnishing sheet brass stampings?

Answer No. 2—If the brass stampings have been annealed it is advisible to first pickel, then bright dip and burnish with soap and very small amount of cyanide.

Question No. 3—What is the cause of a brass solution after two or three loads of work to change color?

Answer No. 3—The following suggestions were offered: Increasing the metal content, adding small amounts of carbonate of ammonia or sodium cyanide.

Question No. 4—What is the cause of silver-plated ware forming dark patches or blotches on the deposit after the current is shut off? What is the remedy?

Answer No. 4—This happens in solution low in metal and low in free cyanide.

Question No. 5—What causes a hot cyanide copper solution to pit?

Answer No. 5—Too much caustic soda or too high a temperature.

Question No. 6—Why does it take longer to black nickel plate on bronze than it does on brass on nickel silver?

Answer No. 6—It was recommended that articles should be first nickel plated and then black nickeled; also to use a cyanide dip instead of acid dip to remove tarnishing before putting same in plating solution.

Questions No. 7—How can statuary bronze finish be obtained on brass without copper plating first?

Answer No. 7—One of the members is writing a paper on this subject which will appear in the Review, all those interested please take notice.

Question No. 8—I have a hot cyanide copper solution made up as follows: Water, 1 gallon; Sodium cyanide, 7 ounces; Copper cyanide, 6 ounces; Soda ash, 1½ ounces; Caustic Soda, ¼ ounce. It plates rough and with lose crumbs of copper, the anodes coat with a black scum, what will remedy these three faults?

Answer No. 8—It was recommended to increase the cyanide content as it is evident from the formula that there is not sufficient fre cyanide.

Waterbury Branch

The opening meeting of the year 1924, for Waterbury Branch, A. E. S., proved to be an interesting one, for all present. The remarks on the various subjects brought before the meeting for discussion were of an enlightening nature and were enjoyed not only by the local members but also by visiting members of the Cleveland-Providence and Bridgeport Branches. The economy found in the use of simple nickel salts, proved to be a popular subject for discussion, as did the subject of maintaining a brass solution, without the use of carbinate or cyanide copper. An interesting talk on the subject of Nickel Anodes, was given by James Garde, of the Cinn. Brass Foundry Co. Arrangements have been practically completed for an illustrated talk on Nickel Deposition by Dr. W. Blum

of the Bureau of Standards. The lecture is scheduled for Monday evening.

The many local friends of Wilfred McKeon of Pittsburg Branch were pleased to learn from a letter recently received that Mr. McKeon, although not entirely recovered expected to leave for home shortly. Mr. McKeon has been confined in the Chambersburg, Pa., hospital for the last couple of months, due to an automobile accident.

Waterbury Branch received two applications for membership, and granted one transfer at its last meeting. George B. Hogaboom, one of the organizers and first president of the local branch, was transferred to Hartford Branch. Mr. Hogaboom is now employed in New Britain, wherein he has resided for several years past.

Much regret was expressed by the local members in learning of the auto accident that befell Wm. McKeon of the Pittsburg Branch. His friends here are hoping that his stay in the hospital at Chambersburg, Penn., will be of short duration.

An interesting report of the recent meeting held in New Britain, for the purpose of acquainting the manufacturers and platers of that section, with the working of the A. E. S., was given by Wm. Delage. Harold Pierso outlined the work of the chemistry class for the ne xt few metings. Norman Tice remarked on the iron content, found in the analysis of several grades of nickel anodes.

J. C. Oberdender and Frank Townsend of Bridgeport Branch were present and added much to the gaiety of the Christmas party, which followed the business session.

Bridgeport Branch

Bridgeport's report of the December open meeting and regular meeting of January 4: Mr. Frank A. Townsend was speaker for December and delivered a talk on buffing compositions, which was a delightful and instructive talk, bringing forth points about binders and abrasives, which was very well received.

One new member was elected to membership. We are trying hard to get the High School to form a chemistry class and believe we will be quite successful. There seems to be more enthusiasm in meetings this winter, both in our open and regular, by the attendance usually from 35 to 50 being present. With a wish of a Happy and Prosperous New Year.

St. Louis Branch

Regular meeting held on December 4. The attendance was kept down by the bad weather, although the meeting was very interesting.

We were pleased to have F. J. Bruner of Cincinnati Branch with us.

Our board of managers reported favorably on the three applications presented at last meeting and they were elected to membership.

Communication from Milwaukee Branch requesting papers for convention was read and acted upon favorably, as three members volunteered to act. These members have never before submitted anything to convention program. We hope this news may be an incentive to others.

Cincinnati Branch

The Cincinnati branch have held a very successful meeting with good attendance and our laboratories are shaping up nicely, but owing to the holiday season our last meeting of 1923 will be held on December 13; then again the second week of January, 1924, which will be plenty of time and have a good start for 1924; also on Sunday, November 24, Cincinnati Branch, A. E. S., held a bowling party at J. Reichert's bowling alley, and were served with the best Ohio river fish that could be purchased, and a very enjoyable party it was, but the after results had some pain attached to it, but nevertheless it was a good time for all. The champion bowlers were Ed. Ade and Tom Whithead. I would like to tell who were the boobe bowlers, but as he is afraid of a challenge from some other branch it is best to let good enough alone. Our meetings on every Thursday have been the best yet, and we hope to get out the full quota right after the first of the year and get down to good stuff. The Cincinnatic Branch wishes the best greeting to all A. E. S. members in the holiday events. A Merry Christmas and Happy New Year to all A. E. S.

New York Branch

The New York Branch held its semi-monthly meetings on November 9 and 23, respectively, at the Broadway Central Hotel, the meeting being well attended. Mr. Joseph San Petro, our newly elected member, was duly initiated and introduced to the members, and his promise was given to work for the society and promote the welfare of the New York Branch.

A good lively committee was appointed to take care of our annual banquet to be held on February 23, 1924, and we hope to make it surpass all previous banquets, which will be going some.

In good and welfare a lively discussion took place on the subject of pitting in a nickel solution. The various causes advanced were overdensity of solution, which causes excessive formation of hydrogen bubbles, the solution being too acid, and the bath not being sufficiently electrolized, and low metal content.

Chicago Branch

Our regular meeting, held on December 8, was well attended and very interesting: President Hanlon and Librarian Gilbertson kept things humming all evening.

After reinstating Mr. H. C. Stewart, an old-time member of the Chicago Branch, we read three applications for active membership, which were received and turned over to the investigating committee. Our banquet committee reported that everything was progressing nicely for our banquet. They were also pleased to report that they secured Dr. William Blum, Dr. O. P. Watts and Jos. Hass., jr., for the program, besides a splendid vocal and musical entertainment. The committee is sure this is going to be the biggest and best banquet Chicago Branch ever held, and are in hopes that our members, with members of other branches, take full advantage of the splendid program they are arranging.

The librarian had the following questions in the mystery box:

Question No. 1—What will cause a cyanide copper solution to plate

brass spots? Copper carbonate is made from sulphate of copper and washed and then dissolved in sodium cyanide. Hyposulphide of soda overcomes this trouble, but is objectionable on account of oxidizing.

Answer No. 1—Small additions of liver of sulphur instead of hypo to the solution were recommended.

Question No. 2—What is a good lubricant for ball burnishing die castings?

Answer No. 2—Neutral whale oil soap with small addition of cyanide.

Question No. 3—What is a good formula for a nickel solution for plating automobile parts?

Answer No. 3—A combination of single and double nickel salt solution was recommended.

Question No. 4—What is a good method to brush brass flat plates out of stamped brass; is it necessary to buff first?

Answer No. 4—It depends entirely on the condition of the brass plates when they reach the finishing department and the finish that is required. If the plates are scratched and have die marks on same they must be buffed first and then scratch-brushed with a tampico or brass wire wheel and fine pumice stone, depending entirely on the finish required.

New York Branch

The first meeting of the year, January 11, was well attended, President Morningstar in chair. After regular business a lively discussion followed on uniform deposits of silver-plated articles. Can silver be deposited so that there will be equal thickness on all points of article?

A member presented a piece of brass, nickel-plated in a solution that had been stored in alcohol barrels. The deposit was streaky and pitted, which members explained was due to the glue in the barrels.

Bridgeport Branch

For our open meeting, held January 18, 1924, we had the pleasure of hearing Mr. Howard G. Rice of the Apothecaries' Hall Company of Waterbury Conn., talk on Deloye nickel anodes.

Mr. Rice had a very interesting exhibit and showed samples of electrolytic nickel, shot nickel, ingots of nickel, samples showing structure of the anodes, samples showing structure of anodes after sudden cooling off, samples of buttons of nickel taken from the furnace to determine if the nickel was proper to pour.

Mr. Rice went into detail regarding the furnaces used, bricks used, sand used, pouring, etc. He also answered questions regarding the anodes. One very interesting point he brought up was the HOOKS used in anodes. He showed hooks inserted at various angles and talked of the advantages of using a hook that was screwed into the top of the anode, claiming that this insured a perfect contact.

For our next open meeting we expect to hear Mr. John Christie of the Bridgeport Brass Company.

Boston Branch

Boston Branch held a small meeting Friday, the 18th, at the American House, with the President Nihan, in the chair.

This branch will meet hereafter on the first Friday of every month at the American House at 8 p. m.

Boston Branch will hold an open meeting on Wednesday, March 5, at the American House, 8 p. m., when we will have as the speaker of the evening Dr. W. Blum of the Bureau of Standards.

There was no report of the committee on the nickel itch, as we have received no answers from those who have received treatment. Until we have we will not make any more reports.

APPLICATIONS FOR MEMBERSHIP

Chicago Branch

Charles H. Brenton, Active .....R. D. 1, Box 1, Burlington, Wis.
L. P. Chapman, Active .....6345 University Ave., Chicago, Ill.

Philadelphia Branch

E. J. Woodinson .....Gray's Ferry and 33d St., Philadelphia, Pa.

Detroit Branch

Percy Joseph Crozier, Active
15 Oak St., Grosse Point Farms, Detroit, Mich.
Fritiof Steuhagen, Associate
c|o C. B. Shepard Co., Hart and Charlevoix, Detroit, Mich.

Waterbury Branch

E. V. Ball, Active .....53 Gaffney Place, Waterbury, Conn.
Joseph F. O'Neill .....1567 E. Main St., Waterbury, Conn.

ELECTED TO MEMBERSHIP

Philadelphia Branch

Samuel T. Lumbeck, Active .....3304 Washington St., Wilmington, Del.

Bridgeport Branch

Frank A. Pauly .....356 Park St., New Haven, Conn.

Chicago Branch

J. C. Lippens .....317 Dewey St., Michigan City, Ind.
Chas. Banks .....4505 Milwaukee Ave., Chicago, Ill.
Walt H. Loveland .....3304 W. Adams St., Chicago, Ill.

RESIGNED

Chicago Branch

Andrew Nielsen .....1640 N. Rockwell St., Chicago, Ill.

SUSPENDED

Philadelphia Branch

D. F. Cranor ....Conshohocken

BOSTON

Regular meetings are held first Friday of each month, at 8 p. m., at the American House, Boston. Secretary, A. W. Garrett. 821 Dorchester Ave., Dorchester, Mass.

BRIDGEPORT

Meets first and third Friday of each month in its laboratory, 260 John St., Bridgeport, Conn. Secretary, David Fleming, 97 Roosevelt St., Bridgeport, Conn.

CHICAGO

Meets second Saturday of each month, at 8 p. m., at the Hardware Club of Chicago, Room 1125. Secretary, R. J. Hazucha, 5128 Warwick Ave., Chicago, Ill.

CINCINNATI

Meets every Thursday, 7:30 p. m., at Vocational Training School, Spring and Liberty St. Secretary, W. J. Husing, 729 McMakin Ave., Cincinnati, Ohio.

CLEVELAND

Meets last Saturday of each month at Hotel Winton. Secretary, H. S. Kneeland, 3924 Clybourne Ave., Cleveland, Ohio.

HARTFORD-CONN. VALLEY

Meets on the fourth Monday of each month at 747 Main St., Hartford, Conn. Secretary, Tennant Elwin, 14 Fredrick St., Hartford, Conn.

DAYTON

Meets first Saturday of each month at the Y. M. C. A., Dayton, Ohio. Secretary, Wm. Hohman, 123 N. Webster St., Dayton, Ohio.

DETROIT

Meets first Friday of each month at the Old Colony Club, 2nd floor, Hotel Tuller. Secretary, E. W. Woodmansee, 1427 Lee Place, Detroit, Mich.

GRAND RAPIDS

Meets on the second Wednesday of each month at the Vocational High School, 129 Bostwick Ave., N.E. Secretary, Chas. S. Whalley, 931 Pine Ave., N.W., Grand Rapids, Mich.

INDIANAPOLIS

Meets the second Saturday of each month at Hotel Denison. Secretary, Louis Mertz, 1725 Union St., Indianapolis, Ind.

MILWAUKEE

Meets second and fourth Thursdays of each month at Lipps Hall, 321 3d St. Secretary, R. Steuernagel, 1508 Concordia Ave., Milwaukee, Wis.

MONTREAL

Meets every Friday at 84 Craig St. West. Secretary, John H. Feelay, 411 Aylmer St., Quebec, Canada.

NEWARK

Meets first and third Fridays of each month at No. 17 Central Ave., Newark, N. J. at 8 p. m. Secretary, George Reuter, 55 Revere Ave., Hilton, N. J.

NEW YORK

Meets second and fourth Fridays of each month at the Broadway Central Hotel Parlors, New York City. Secretary, John E. Sterling, 468 Grand Ave., Long Island City, N. Y.

PHILADELPHIA

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, P. Uhl, 2432 North 29th St., Philadelphia, Pa.

PITTSBURGH

Meets first Saturday of each month at 8 p. m., at United States Bureau of Mines Bldg., Forbes St. Secretary, S. E. Hedden, 227 Fifth St., Aspinwall, Pa.

PROVIDENCE-ATTLEBORO

Meets first and third Thursday of each month at 184 Washington St., Room 308, Providence, R. I. Secretary, Robert Crook, 185 County St., Attleboro, Mass.

READING

Meets on the second Tuesday of each month. Secretary, William M. Fisher, 654 Gordon St., Reading Pa.

ROCHESTER

Meets every second and fourth Friday of each month at the Hotel Seneca. Albert H. Doering, Secretary, 49 Cutler St., Rochester, N. Y.

SYRACUSE

Secretary, M. J. Crean, 109 Court St., Syracuse, N. Y.

ST. LOUIS

Meets first Tuesday of each month at Barr Branch Library, corner Jefferson and Lafayette Sts. Secretary, H. H. Williams, 4156 Botanical Ave., St. Louis, Mo.

TOLEDA

Meets first Thursday of each month at Toledo University Science Building, Electro-Platers' Room, corner Cherry and Page Sts. Secretary, W. W. Weiker, 411 5d St., Toledo, Ohio.

TORONTO

Meets fourth Monday of each month at Canadian Foresters' Hall, 22 College St., Room No. 2. Walter L. Barrows, 628 Dover Court Road, Toronto, Ontario, Canada.

WATERBURY

Meets every second and fourth Friday of each month. Secretary, Wm. F. Guilford, 230 Cooks St., Waterbury, Conn.